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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/781,881	02/12/2001	Daniel J.C. Herr	5347-204	9632

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EXAMINER

ANGEBRANNDT, MARTIN J

ART UNIT	PAPER NUMBER
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1756

DATE MAILED: 08/06/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n N .

09/781,881

Applicant(s)

HERR ET AL.

Examiner

Martin J Angebranndt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 6/2/03 & 6/9/03.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-13, 16-26 and 29-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-13, 16-26 and 29-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 248
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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1. The response provided by the applicant has been read and given careful consideration.

Responses to the arguments of the applicant are presented after the first rejection to which they are directed. Rejections of the previous office action not repeated below are withdrawn in view of the amendments of the applicant. Claims 11,13,24,26 and 37-38 are allowable over the prior art of record as no teachings of masking a portion of the mask image is taught in the record. The field tip in the Spence et al. reference would also radiate more isotropically than shown and would based upon the disclosure of the Fresnel diffraction image include an unreflected portion which acts as a reference beam. The Spence et al. reference does not disclose the use of a layer formed on a substrate which is patterned.

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 2-13,16-26 and 29-39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

All the independent claims should indicate clearly that the interferometric image is at the image plane (photosensitive layer) and that the reflective surface is not holographic. Rather than indicating that the coherent radiation reflected off the reflector surface provides a holographic projection, the claims should indicate that the portion of the coherent radiation reflected off the reflector surface overlaps with the remaining portion of light unreflected by the reflector surface to produce a holographic projection. The current language does not clearly indicate that the portion of light reflected and the portion of light unreflected together form the holographic/interferometric pattern, but currently attributes it solely to the reflected light. The

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portion of the light not reflected by the reflector surface is missing clear mention of the remaining portion of that light.

Please note that with claims 13,39 and 26, there is a second reflector and corresponding portion of light reflected off it. (figure 11)

Also claim 25 and 38 describe a second source of coherent radiation, which reflects only a portion of the light from a reflector surface. (figure 11)

In claim 2, please replace "maintained and removed" with - - maintained or removed-- .

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2-7,9,10,16-20,22,23,29-33 and 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Joy et al., "Advanced SEM Imaging", in Characterization and Metrology for ULSI Technology", 1998 international Conference, (03/1998), AIP conference proceedings 449, pages 653-666, in view of Elliott, "Integrated Circuit Manufacturing Technology", pp. 76-81 (1982) or Tetsuo et al., JP 11-329944.

Joy et al., "Advanced SEM Imaging", in Characterization and Metrology for ULSI Technology", 1998 international Conference, (03/1998), AIP conference proceedings 449, pages 653-666 teaches forward scattering holography with respect to figure 8 and the text on page 659. The particular detectors used are not disclosed.

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Elliott, "Integrated Circuit Manufacturing Technology", pp. 76-81 (1982) establishes that electron beams resists are old and well known in the art to detect electrons.

Tetsuo et al., JP 11-329944 teaches the use of silicon layers, which are able to be selectively oxidized as image detectors for electron beams.

It would have been obvious to one skilled in the art to modify the process of Joy et al., "Advanced SEM Imaging", in Characterization and Metrology for ULSI Technology", 1998 international Conference, (03/1998), AIP conference proceedings 449, pages 653-666 by using photoresists or oxidizable silicon layers as detection means as taught by Elliott, "Integrated Circuit Manufacturing Technology", pp. 76-81 (1982) or Tetsuo et al., JP 11-329944 with a reasonable expectation of capturing/resolving the desired diffraction image based upon the disclosure of the use of these means in the art for detection of electrons and having a permanent record of the pattern.

While the Joy et al. reference is analyzing the surface, the resultant data constitutes and image as the technique is a surface imaging technique. The measurement is not one of composition or the like, but rather surface topography. There are clearly lines representing coherent radiation which do not interact with the surface and those which are scattered or reflected and these combine to form an interference pattern at the interference plane as shown in figure 8 of that reference. No means for visualizing that interference pattern is disclosed, but layer sensitive to electrons are old and well known in the art and these provide for a permanent image to be formed, which may be referred to later without worry of degradation. The electron resists and silicon layers of Elliott, "Integrated Circuit Manufacturing Technology", pp. 76-81 (1982) or Tetsuo et al., JP 11-329944 are well known in the art as sensitive to electrons and this

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is what is emitted by the nanotip of Joy et al., therefore it is obvious to combine the teachings to enable capturing/resolving the desired diffraction image with a reasonable expectation of success.

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

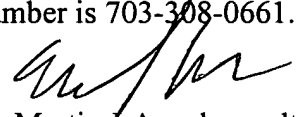
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J Angebrannndt whose telephone number is 703-308-4397. The examiner can normally be reached on Available Mondays-Thursday and alternative Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 703-308-2464. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Martin J. Angebranndt
Primary Examiner
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August 5, 2003